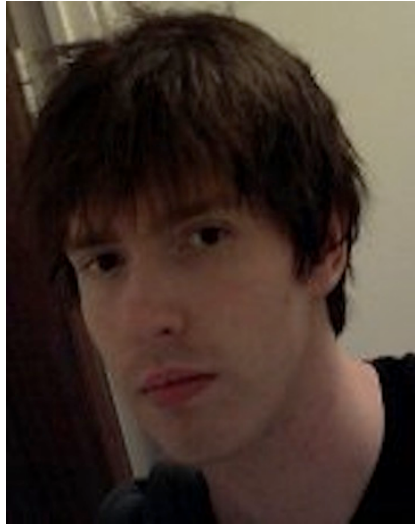


Information Science and Technology Seminar Speaker Series



Gordon Ross
Imperial College London

“Modeling Human Activity via Branching Point Processes”

Wednesday, September 5, 2012
3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: Many processes involving humans and computers generate activity data, which record the times at which certain types of events occur. For example, credit card companies typically log their customer's usage times in order to detect fraud. Similarly, monitoring activity rates in a computer network can be an important tool for rapidly detecting cyber attacks.

A common problem which arises when working with activity data is the identification of anomalies and changes; given a history of events, can we identify particular periods which look unusual? This requires the construction of a model for typical background behavior, which can be difficult since the seasonal and bursty nature of event data makes simple Poisson assumptions invalid. We present a model for event data which combines a rate switching Poisson process with a self-exciting component in order to handle burstiness. Expressing the model in terms of a latent branching structure allows for efficient Bayesian estimation through a combination of Gibbs sampling and exact sampling.

Biography: Gordon Ross completed a PhD in statistics from Imperial College London in 2011, and currently works as a postdoctoral fellow at the University of Bristol. His research focuses on modeling dynamic sequential data, which includes finding distributional changes in data streams, the analysis of social networks, and statistical process control.